

A Stewardship Handbook

for Family Forest
Ownerships



A Handbook For Planning, Managing and Protecting
Your Woods, Your Investment and Your Environment

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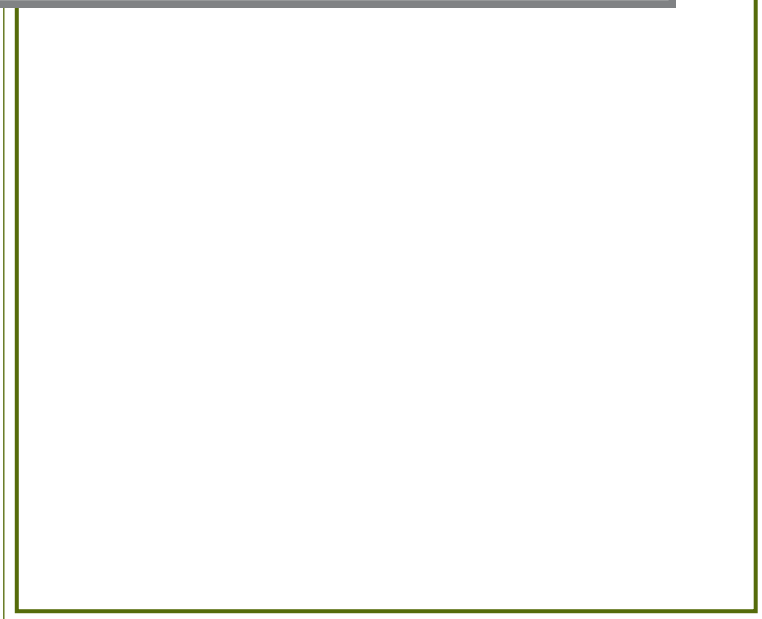
National Association of State Foresters
Sustainable Forestry Implementation Committee

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National Association of State Foresters

Stewardship Handbook for Family Forest Ownerships: A Handbook For Planning, Managing and Protecting Your Woods, Your Investment and Your Environment

Preface

The National Association of State Foresters (NASF) is comprised of the directors of the state and territorial forestry agencies and the District of Columbia. Through public-private partnerships, NASF seeks to discuss, develop, sponsor and promote programs and activities which will advance the practice of sustainable forestry, the conservation and protection of forest lands and associated resources and the establishment and protection of forests in the urban environment.

Purpose

This handbook is written to provide information:

For ...

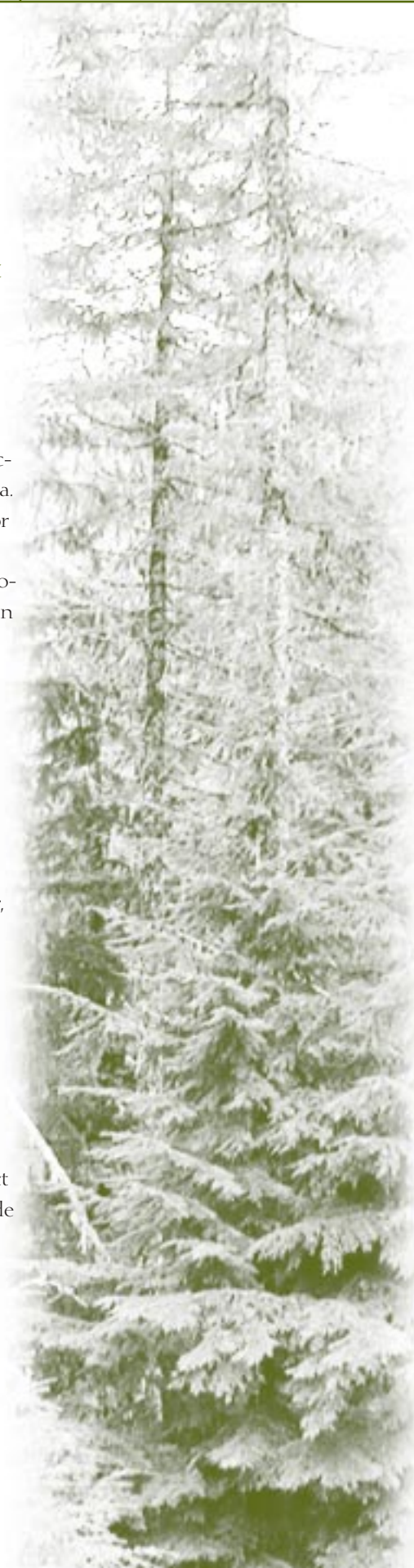
those owners of the nation's family forests – the nine million plus small non-industrial forest and woodlot owners, especially those of you who are in the early stages of considering how best to care for, and become a successful steward of your forest.

To ...

provide you with some initial guidance and tools to organize and implement your objectives within the context and pursuit of forest stewardship.

By ...

the National Association of State Foresters (NASF) with deep respect and appreciation for the role and contribution family forests provide the nation's beauty and bounty.





Introduction

Today's forests are recognized as more than just trees, but rather as an interactive community of plants, animals, soils and water that influence their surroundings. The public shares this recognition in their growing appreciation for the great outdoors, clean air and water, wildlife and forested vistas. This appreciation gives renewed emphasis to the concept of stewardship—reinforcing the idea that a forest owner can be more than just a guardian or investor, but also a steward who pursues personal goals today while sustaining opportunities for tomorrow. But, the family forest owner who wants to “do right by the land” is offered both opportunity and challenge. Consider for example:

- Small forests or woodlots provide benefits beyond an owner's goals to both neighbors and nearby communities. Trees provide a food for particular wildlife. Harvests support local payrolls. Healthy [forest vegetation](#) cushions potential downstream [storm-water](#) damage.
- That directions provided by a state's [Best Management Practices](#), or a label's directions for forest chemical use, or a county's regulation for [prescribed burns](#), can all be complex.

To help, NASF published its **Principles and Guides for a Well-Managed Forest** (P&G) in 2003 (see Appendix A). These P&Gs will be used throughout this handbook as examples of the assistance a common framework can provide in organizing your plans, practices and achievements. This follow-on handbook has been developed as a companion to the P&G to offer assistance to the family forest owner facing two fundamental questions:

- 1. How might a family forest owner use a set of principles to prioritize and plan—develop a Stewardship Plan?**
- 2. How might a family forest owner recognize results of good stewardship out on the ground?**

Your own ideas, goals and vision are the basis for these answers. However, important functional details and local professional expertise, should be sought to provide specific, information, data and effectiveness to your progress and achievement.



Photograph provided by the Mississippi Forestry Commission.

NASF Stewardship Principles

Stewardship is the pursuit of a forest owner's personal goals within a set of stewardship principles. Taken together, your goals with these principles, serve the overall and long-term health and vigor of your forest or woodlot. And because forests are living and ever-changing, stewardship is "a work in progress," the sooner begun, the more regularly tended, the better the results. Consider for example how your own ownership goals would fit into the following example (NASF's P&Gs).

- Principle 1** Contribute to the Conservation and Biological Diversity of the Forest and the Landscape in Which it Resides
- Principle 2** Maintain and Improve Productive Capacity
- Principle 3** Maintain the Health and Vigor of the Forest and its Landscape/Watershed
- Principle 4** Protect Soil and Water Resources
- Principle 5** Consider Carbon Cycles
- Principle 6** Consider Socio-Economic Benefits
- Principle 7** Comply with Laws and Rules and Implement Applicable Guidelines in States not Using the Regulatory Approach



Photograph courtesy of the Alabama Forestry Commission.

Stewardship Principles

*I*f you think for a moment, especially as you consider your own objectives, plans and actions, this list of principles relates to your forest or woodlot in a very personal way.



Principle 1

Contribute to the Conservation and Biological Diversity of the Forest and the Landscape in Which it Resides

How will your objectives, plans and actions promote conservation of *biological diversity* in your own forest and on the local *landscape*?

- Like all forests, yours includes both trees and other plant life such as shrubs, ground cover and even mosses and *algae* in your shady places or around your seeps and springs. Your forest is also a habitat for resident and migrating animals, including game and non-game, and even the smallest of insects in your soil and water.
- Your forest's community of plants and animals (referred to as biodiversity) is part of a broader mix of communities across your surrounding landscape (or watershed), like a patch in a quilt.

Your Personal Goals

Photograph provided by the Mississippi Forestry Commission.





Photograph provided by the USDA Forest Service.

Principle 2

Maintain and Improve Productive Capacity

How will your objectives, plans and actions maintain or improve your forest's productive capacity?

- Like most forests, yours could provide income from timber sales, as well as a broad range of other goods and services, e.g., habitat lease-able to local hunting clubs, mushroom gatherers, or trail enthusiasts. But productivity also logically includes such non-market services as storm-water [filtration](#) for your local [watershed](#), or the nesting cavities and insects offered songbirds by a [snag](#) (standing dead tree), and even your success in preventing the establishment of [invasive species](#), such as kudzu, emerald ash borer, or purple loosestrife.

Note: While a number of plants and even insects have been both purposefully and accidentally introduced into the country, some are now considered serious enough threats to local ecological function to be as seen invasive and viewed by forestry professionals as pests needing eradication.

- On a broader scale, your forest's productivity also contributes to the local potential to attract and sustain economic investment. Be it a lumber or paper mill, or tourism for bird-watching, trail networks, or clean and productive waters, investments such as these sustain your local community, as well as its regional economies.

Your Personal Goals



Principle 3

Maintain the Health and Vigor of the Forest and its Landscape/Watershed

How will your objectives, plans and actions maintain or improve the health and vigor of your forest and its *landscape* or *watershed*?

- The life cycles of your forest's plants and animals ebb and flow with age and climate, as well as the cycles of natural risks such as storms, insect invasions, wildfire, drought, and even similar events on adjacent lands and watersheds.
- The degree of your forest's potential to influence, and be influenced by, the health and vigor of its surrounding landscape varies with its history and general condition, e.g., mix of species and ages.



Photograph provided by the Mississippi Forestry Commission.



Your Personal Goals



Photograph courtesy of the Alabama Forestry Commission.

Principle 4

Protect Soil and Water Resources

How will your objectives, plans and actions protect soil and water resources?

- Your forest plays an important role in the fertility of its own soils (through such dynamics as leaf/needle-fall and its contribution to topsoil health), as well as the health and vigor of the *food-web* of plants and animals that rely on that topsoil.
- Your forest's role as a filter—*forest litter* catching water-borne *sediment*, cushion—foliage softening the impact of storm-driven rain, and sponge—catching storm-water for gentle release over time, serves critical needs on both your own and your neighbor's ownership in your watershed.

Your Personal Goals



Principle 5

Consider Carbon Cycles

How will your objectives, plans and actions influence *carbon cycles*?

Note: The earth's **carbon cycle** involves our reliance on **fossil-based fuels** which, when used, release **carbon** into the atmosphere. This release can be countered by plant, animal and especially a forest's use of carbon for growth and energy storage.

- All forest plants and soils “store” carbon, so your management influences the natural cycles of that storage in both living and dead plant material. Your management can promote more plant growth per acre. Your harvests can promote durable wood products. Your operations can protect both standing and fallen dead trees as well as woody material on, and as roots beneath, the forest floor.
- In climates where wood fuels can substitute for a non-renewable energy source, your management for **biomass**/fuel-wood can slow the addition of “new” carbon to the atmosphere's overall carbon-cycle base.



Photograph provided by the USDA Forest Service.



Your Personal Goals



Photograph provided by the USDA Forest Service.

Principle 6

Consider Socio-Economic Benefits

How will your objectives, plans and actions influence local communities and economies?

- In meeting your personal goals, you also consider how your forest contributes to your community's economy and quality of life, through such factors as local payrolls, tax base, attracting related investment, as well as such complementary activities as [forest-based cultures](#), traditions, and sense of well-being.

Your Personal Goals



Principle 7

Comply with Laws and Rules and Implement Applicable Guidelines in States not Using the Regulatory Approach

How will your objectives, plans and actions comply with laws, rules and guidelines?

- As with all forests, yours not only serves your personal goals, but is also subject to laws and guidelines designed to serve your community and the nation at large. Therefore, it is not only in your best interest as a good neighbor to abide by them, but also to avoid legal consequences and maximize the goals such laws and regulations serve, including such benefits as clean water, rare plants or animals and public safety.
- Your forest's potential to be influenced by such laws and regulations typically has little to do with its size, but often a lot to do with its location and its past management.
- And even in those states not using a regulatory approach, the opportunity to voluntarily serve the common good lies at the heart of being a good forest steward.



Photograph provided by the USDA Forest Service.



Your Personal Goals



Photograph provided by the Delaware Forest Service.

Stewardship Planning

As with any enterprise, successful stewardship relies heavily upon the time and energy invested in planning. Sooner or later, a family forest owner recognizes that the best way to capture the full benefit of the blending personal goals with stewardship principles comes when you take the time to develop a **Stewardship Plan**. Such a plan, geared to the size and condition of your ownership, is not only a blueprint for action, but also confirms your objectives, guides your progress and targets change as your forest and knowledge grows. Indeed, professional managers in both the public and private sectors routinely develop, employ, monitor and over time amend, plans to assure their own good stewardship. Here again, NASF's Stewardship Principles offer a handy template, within which to address your personal objectives and priorities. Such a plan frames your effort, and tracks events, milestones and accomplishments to focus your work, avoids surprises, as well as maximizes your satisfaction and returns on your investment.

Note: Professional assistance in your stewardship plan development efforts can prove very helpful, and is often available from your local *state forestry office*, professional *consulting foresters*, *extension and academia*, and such sources as the *Natural Resource Conservation Service*, *National Association of Conservation Districts* and *Resource Conservation and Development Councils*.

Generic Framework for a Forest Stewardship Plan

Principle 1 Contribute to the Conservation and Biological Diversity of the Forest and the Landscape in Which it Resides

- What goals do you have, or steps will you take to conserve and enhance your forest's biological diversity, [threatened/endangered](#) species, etc., and what will your forest contribute to the diversity of the landscape or watershed in which it resides?

Principle 2 Maintain and Improve Productive Capacity

- What goals do you have, or steps will you take to maintain or improve your forest's productive capacity, e.g., timber, non-timber, habitat, soil, etc.?

Principle 3 Maintain the Health and Vigor of the Forest and its Landscape/Watershed

- What goals do you have, or steps will you take to maintain or improve your forest's health and vigor and its contribution to the overall health and vigor of its landscape and watershed?

Principle 4 Protect Soil and Water Resources

- What goals do you have, or steps will you take to conserve and enhance your forest's soils?
- What goals do you have, or steps will you take to conserve and enhance your forest's waters, water-based resources and the watershed of which it is a part?

Principle 5 Consider Carbon Cycles

- What goals do you have, or steps will you take to address your forest's unique features such as carbon?





Principle 6 Consider Socio-Economic Benefits

- What goals or steps will you take to address local cultural or socio-economic benefits?

Principle 7 Comply with Laws and Rules and Implement Applicable Guidelines in States not Using the Regulatory Approach

- What goals do you have and steps will you take to learn of and comply with relevant laws and guidelines, e.g., *State Forest Practice Acts*, or *Best Management Practices*, collaboratively developed voluntary guidelines, etc.?
- What goals do you have and steps will you take to be a good neighbor?

Indicators of Good Forest Stewardship

Forest stewardship is an ongoing, long-term and adaptive process—you will learn from your actions, investments and even inaction, as each begins to display results—indicators of your progress. This progress, however, can be complex because a forest's health and vigor is governed by variables such as climate, soils, and the interaction among its trees, plants and animals. These, among other factors, make progress often subtle, intermittent and difficult to gauge. Taking the time to consider what efforts, events, milestones or accomplishments (***Stewardship Indicators***) you might use to track your plan's success can help focus your work and avoid surprises, as well as maximize satisfaction and returns on your investment. Outlined below is an example of an entire framework of generic "indicators" built around the same NASF's Stewardship Principles used in the development of the plan illustrated above.

Note: The following lists contains occasional duplications necessary to address the multiple roles some forest elements play in a forest's health and vigor (soil—for growth, soil erosion, soil as sediment), as well as to avoid accidental oversight by the reader checking just one topic.



Generic Indicator Framework for a Forest Stewardship Plan



Principle 1

Contribute to the Conservation and Biological Diversity of the Forest and the Landscape in Which it Resides

- A. You use the local expertise necessary to assess your forest/woodlot's potential for habitat, biodiversity and uniqueness, as well as its role across your landscape/watershed. For example, you might work with your state forestry and wildlife agencies, Extension Service, forestry consultants, *State Natural Heritage Programs*, or specialized interest groups like *The Audubon Society*, *The Izaak Walton League* or *NatureServe*.
- B. You manage your woodlot by making use of a variety of tree species and ages as well as promoting diverse *under-story* vegetation as a means to promote adequate habitat, travel corridors, and food-webs across and with your forest and its landscape/watershed.
- C. You manage for snags (standing dead trees), den trees, coarse woody debris (limbs and trunks) collecting on your forest's floor and in your forest's waterways, (e.g., streambed structure where such materials can be critical to *spawning beds*, and *micro/macro-invertebrate* habitat), for their collective roles in contributing both to both local habitat and *food-webs*.
- D. You are aware of and, where logical, track your ownership's diversity (plant and animal) wildlife (both game and non-game and perhaps even insects when they might be important) as well as cover and forage options.
- E. Where logical, you cooperate with local interests working to maintain habitats and diversity in your watershed.
- F. You coordinate and monitor your management activities to maintain and enhance your forest's biodiversity. For example, you avoid operations during song/game-bird *nesting season*, track



Photograph provided by the USDA Forest Service.

and manage the species and ages of your trees, manipulate the size, shape and orientation of your stand openings to consider the importance of *under-story* to both plants and animals.

- G. You monitor and respond to forest change (*natural mortality* and *regeneration*, aging, *succession*, pests, and *catastrophic events* such as severe storms or wildfire) for use in your decision-making, as well as track overall growth, the success of your own planned regeneration and overall forest health and vigor for their effects on both your own and adjoining ownerships.



Principle 2

Maintain and Improve Productive Capacity

- A. You've determined and mapped your forest's timber types and productive capacity, for both timber as well as other products that might be gathered/harvested, taking into account factors that might influence your decision making, e.g., steep slopes, *fragile soils*, wetlands and uniqueness (*raptor* nests, *vernal pools*, cultural and gravesites, etc.).
- B. In those area's targeted for timber production, you've calculated and documented your forest's growth rates by *timber type*, *rotation ages* and harvests schedules (be they *even-age* [*clear-cut*] or un-even age [*selection-cut*]), and include regeneration programs to assure sustainable yields.
- C. You monitor harvests and mortality to schedule regeneration in order to maintain long-term growth and harvest balance, as well as your forest's overall capacity to assure and enhance its overall community of plants and animals.
- D. You use science and technology appropriate to the size of your forest or woodlot, e.g., such tools as herbicide/pesticide use, computer models for growth and risk potentials.

Note: Regarding your potential use of forest chemicals—stewardship stresses prudent use, label compliance, ensured safety, legal and environmental compliance, training, record keeping and logical neighbor notification of pending application.



Photograph courtesy of the Alabama Forestry Commission.

- E. Your operations maintain the overall long-term vigor of your timber's growth (e.g., you track issues such as tree spacing, pests and [mechanical damage](#)) as well as critical elements such as the fertility of your forest's soils.

Note: Soil regeneration, as provided by decay of both fallen leaves/needles, twigs, limbs and even trunks of downed trees, as well as the organisms that feed on them are important and should be managed and valued as important elements of your forest's long-term productivity.

- F. Whenever you decide to use a [contractor](#) for professional services, you are sure each is appropriately trained (BMPs, etc.), credentialed and insured, e.g., consulting foresters, loggers, chemical applicators, road builders/maintainers.
- G. Your contracts are written and then monitored to assure safe and efficient operations, minimal harvest damage/waste, and sales of the materials removed to the best available markets.

■ Principle 3

Maintain the Health and Vigor of the Forest and its Landscape/Watershed

- A. You manage your forest or woodlot's vegetation, species-mix, stocking, spacing, age-classes, regeneration, prescribed fire, fire-breaks, etc., to reduce risk from wildfire, pests and invasive species, and ensure long-term forest health and vigor.
- B. You cooperate with your neighbors, and local, state and federal agencies regarding risk assessments from wildfire, insects and diseases, invasive species, relative to their [monitoring](#), prevention as well as response efforts.
- C. You track forest health issues e.g., *fuel loads*, insects and disease, mortality, invasive species, by keeping your own observations or accessing records from professional sources, e.g., State Forestry agencies.



Photograph provided by the Mississippi Forestry Commission.

- D. Where grazing is involved, you protect your forest water bodies (springs, wetlands, streams, ponds, etc.) and vegetation via practices such as *riparian* zone protection, *rotational pasturing*, and where necessary work with local wildlife officials to assist in the management of wildlife populations.



Principle 4

Protect Soil and Water Resources

Soils

- A. You comply with your state Best Management Practices.
- B. You have taken the time to learn about your forest's soils and observe their influences from topography (e.g. National Resource Conservation Service soils maps, US Geological Service topographic maps), and factor this information into your planning and overall management.
- C. You manage the potential consequences to your soils from storms, fire and other damage (blow-down, run-off, etc.), especially on your sensitive sites (steep slopes/erodible soils) as well as during activities with elevated risk for associated soil damage (road maintenance, harvests, site preparation, etc.).
- D. You use practices that promote soil stability and water quality (e.g., you use appropriate *water bars*, *rolling dips*, road and *turnout* maintenance, *contoured site prep*, and the timing of your harvests to avoid heavy rains), and employ an analysis of your soil's fertility before fertilization to maximize effectiveness and prevent excess nutrient runoff.
- E. You take care regarding wild and prescribed fire in soil-sensitive situations, e.g., steep slopes and/or erodible soils, and such practices as installation and maintenance of fire-breaks, fire suppression activities, timing and intensity of prescribed fires.



Photograph provided by the Alabama Forestry Commission.

Water

- E. You've identified, mapped, and taken into account, your forest's water and riparian resources by noting important elements (such as *high-water marks*, springs, *ephemerals*, streams, *vernal pools*, ponds, wetlands, etc.) as you plan, operate and track such activities as:
- The identification, design, establishment, mapping and management of your forest's streamside and water-body buffers.
 - Conserving the plants and animals of your forest's riparian areas.
 - Weather events and their results as disturbances to both your forest and its watershed e.g., seasonal flooding, that could be influenced by your operations, e.g., roads, harvests
 - Determining your need for forest chemicals as well as their selection, application and safety
 - Determining any site preparation needs, practices and oversight
 - Road placement, construction and maintenance, especially at stream crossings
 - Fire use, and wildfire prevention and response, especially regarding your establishment and maintenance of *firebreaks*
 - Pest monitoring, risk management and outbreak response
 - Recreation activities (personal and leased), and the impact of associated equipment and disturbance (deer-stands, ATV use, cross-country skiing, trash accumulation, etc.).
 - Resource management activities, especially use/movement of vehicles, heavy equipment and stand disturbance (skid trails, landings, trash accumulation).
- G. You understand and effectively apply your state's Best Management Practices, or where applicable, Forest Practices Act as they relate to your forest and your management activities.
- H. When contracting for forestry services, you specify *BMP training*, performance requirements (and penalties for non-compliance) and monitor performance on all your forestry-related operations.

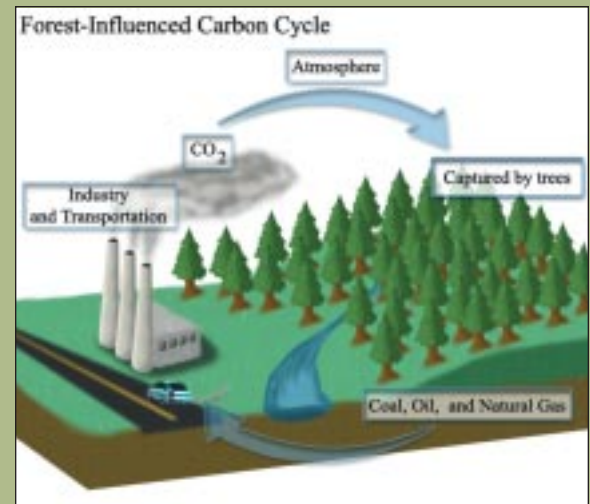


Photograph provided by the Delaware Forest Service.

Principle 5

Consider Carbon Cycles

- A. You consider carbon cycle's role in your forest's health, vigor and management, in practices such as *rotation age* selection, site preparation activities, and forest litter treatments.
- B. Where logical you market wood for fuel.



Forests can capture carbon dioxide generated by industry, transportation, and other sources. The forest separates the carbon dioxide, using the carbon for growth and releasing oxygen for cleaner air. Diagram created by Adam Gendron.

Principle 6

Consider Socio-Economic Benefits

- A. You avoid waste and work to maximize stewardship's contribution to your own as well as your community's economy and quality of life.
- B. You pay your taxes, and where logical, consider local forest tax incentive programs.
- C. You comply with local labor, safety and wage laws.
- D. You respect local customs and the role traditions, settings and sites may play in the heritage and values of others, e.g., a civil war site, a historic road or trail, etc.
- E. Where feasible, you allow public access and also participate in local activities addressing trespass, dumping and timber theft.
- F. You consider your community's value of aesthetics in the implementation of your forestry practices.



Photograph provided by the Mississippi Forestry Commission.

Principle 7

Comply with Laws and Rules and Implement Applicable Guidelines in States not Using the Regulatory Approach

- A. Where applicable, you comply with the direction provided by your state's Forest Practices Act, your state's Best Management Practices, and any collaboratively developed forestry guidelines and standards.
- B. Where feasible, you take the time to contribute to state and local efforts in the development of all the above in order to assure attention to the perspectives of the small/family forest owner.
- C. You take the time to learn of and comply with all local, state and national laws and regulations (e.g., seasonal road use, Best Management Practices, State Forest Practices Acts, the [Clean Water](#), Clean Air, and [Endangered Species Acts](#)), as they relate to your forest and your Stewardship Plan.
- D. Where feasible, you take the time to be an active member and collaborate with your local forest landowner community and take advantage of opportunities to make your ideas and priorities known, especially regarding issues that affect your lands and your objectives.
- E. You take the time necessary to assure that your plans and operations adequately address safety and respect all cautions and safeguards suggested by forestry-related expertise and advisories, e.g., you obey periodic bans on open burning, seasonal road load limits, you seek appropriate professional advice, and you comply with all safety advisories.
- F. You stay aware and considerate of your neighbor's concerns and issues.
- G. When practical, you collaborate with your local forestry organization public education and outreach efforts, e.g., youth programs, field days, etc.
- H. You are careful to minimize your operation's potential for "neighborhood-impacts". You track such sources as noise, dust, smoke, chemical use, accidents, trash accumulation, etc.



Photograph provided by the Delaware Forest Service.



Photograph provided by the Mississippi Forestry Commission.

Summary

*F*orest Stewardship is as challenging as it is rewarding. And when you consider how long it takes some trees to grow, it spans human lifetimes. Like most other worthy undertakings however, successful stewardship should be measured both as steps along the journey as well as in reaching your personal goals. It is a commitment to paying at least as much attention to the forest that remains, as is paid to harvests. It is discovery as both forests and the science and practice used in their stewardship evolve and grow. It is rewarding for all the above, and for those moments when there is nothing you would rather be doing. The work you and the expertise you access from other sources when framed by standards, plans, and indicators is the key to sustaining your forest and its long term benefits.


Quick Descriptions of Some of the Terms Used in This Handbook

More formal information regarding these terms should be sought from relevant texts, dictionaries, glossaries and especially local expertise.

Algae	aquatic plants important in some forests' diversity, food webs and habitat
Aquatic	pertaining to water and the forest-based plants and animals that reside or migrate therein
Assessment	periodic tracking and recording of progress relative to goal-based plans
Best Management Practices (BMP)	state-specific guides relative to water influencing forest practices
Biological Diversity	diversity in forest-related plant and animal populations relative to expected local circumstances
Biomass	the sum of forest-related organic matter (both living and dead) in a given area
Carbon	a chemical element critical to plant growth and the earth's life and atmosphere
Carbon Cycle	the transfer of carbon between the earth (soils, coal, oil etc.), use (leaves, fuels), and the atmosphere
Carbon Sequestration	the capacity of plants and their products to "store" carbon removed from the atmosphere
Catastrophic Event	storms, fires, etc. of a serious enough nature to totally alter a forest
Clean Water Act	federal law prescribing water protection
Clear Cut	removal of all merchantable material for the purpose of regenerating a new forest
Connectivity	forest management that assures wildlife cover between habitats (see corridor)
Consulting Forester	a trained forestry professional available for periodic advice and technical assistance
Contractor	a trained professional available for circumstance-specific services
Corridor	a dedicated wildlife travel route (see connectivity)

Course Woody Material	branch, trunk and stumps on a forest's floor critical to food-webs habitat and soil regeneration
Endangered Species Act	federal law prescribing wildlife protection
Ephemeral	seasonal water flow directly feeding a recognizable watercourse (typically a stream)
Even/Uneven Age	terms describing forests that are managed by focus upon the age of their trees
Extension Forester	a specially trained academically based forester available for forest owner advice
Forest-Based Cultures	peoples/customs with special connections to forest settings or a particular forest feature
Filtration	a forest's capacity to remove water-borne solids as water moves through
Fire Break	a specially designed disruption to a forest's flammable materials to inhibit fire spread
Forest Practice Act	state legislation specifically designed to direct forest-related activities
Food Web	the interconnected relationship between plants and animal food requirements
Forest Vegetation	all of a forest's plant material from the deepest root to the highest leaf and all plants in between
Fossil-Based	when referring to energy sources, specifically those from coal, oil and natural gas
Fragile Soils	soils especially susceptible to water or wind erosion and/or landslides
Fuel Load	accumulated forest materials judged to be susceptible to combustion and fire spread
High Water Mark	location along/surrounding a water body where seasonal flows/accumulations reach highest level
Invasive Species	introduced plants or animals (including insects) whose competition with natives make them pests
Landscape	surroundings
Forest Litter	accumulation of dead plant material on a forest floor
Mechanical Damage (Residual Stand Damage)	damage to standing trees caused by forestry equipment
Micro/Macro-Invertebrate	the smallest of animal organisms typically found in soils and waters





Monitoring (see assessment)	practices to regularly observe and judge activities and progress
Natural Mortality	death from natural causes
Nesting Cavity	a sheltering opening-interior space within a tree used by wildlife
Nesting Season	that portion of a year when wildlife bear and raise their young
Photosynthesis	green plant use of sunlight, water, minerals and carbon dioxide to make food
Prescribed Burn	use of a controlled fire to achieve a forest management goal
Raptor	bird of prey
Regeneration	a program or the product of efforts to re-establish trees on a forest site
Riparian	areas along or surrounding forest water bodies
Riparian Management Zone	a zone for special management along or surrounding forest water bodies
Rolling Dip	an angled depression across a road designed to prevent damage by redirecting the flow of water away from the road's surface
Rotation (age)	the age or life-span target for scheduling final timber harvests
Rotational Pasturing	regulated rotation of cattle among grazing areas
Sediment	water borne soil
Seep	seasonal water movement associated with elevation change
Selection Cut	harvests targeting specific species, age and location of trees
Snag	a standing dead tree
Socio-Economic Benefits	a forest's contribution to local communities and economies
Spawning Bed	a stream bed's capacity to support successful local fish egg laying/hatching
State Natural Heritage Program	local programs cataloging & promoting protection of unique natural features

Streamside Management Zone	[see Riparian Management Zone]
Stewardship	pursuit of a forest owner's personal goals within a set of stewardship principles
Stewardship Plan	[see page 12]
Stewardship Principles	[see page 3]
Site Preparation (Site Prep)	preparations for planting/replanting of trees
Storm-Water	large water flows associated with storm events
Succession	natural replacement of plants and their associated animals as life cycles proceed
Terrestrial	land-based plants and animals (as opposed to aquatic)
Threatened or Endangered	plants or animals deemed to be at risk regarding their long-term viability
Timber Type	a forestry designation for a variety of trees typically found together
Turnout	a road ditch segment designed to divert flow to a stream's buffer rather than breach a stream's bank
Under-Story	vegetation below a forest's canopy
Vernal Pool	a small, shallow, seasonal water accumulation usually critical to a forest's aquatic biodiversity and food web
Water Bar	an angled rise across a road to redirect any water prone to flow down its surface
Water Course	a body of water's recognizable location
Watershed	a recognizable area associated with a water course's drainage
Wetland	locations of natural water accumulation





Appendix A: Principles and Guides for a Well-Managed Forest

A report by the Sustainable Forest Management and Resource Management Committees

National Association of State Foresters

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Background

The exact definition of a well-managed forest will be debated as long as there are interest groups that value different sets of attributes available from a forest. There are, however, a number of frameworks commonly perceived to address key components of a well-managed forest, e.g., the World Summit on Sustainable Development, the United Nations Forum on Forests Proposals for Action, the Montreal Process Criteria and Indicators of Sustainable Forests, and the International Forest Industry Roundtable. Fundamental to all is the premise that forests are recognized as a community of interacting plants, animals, soil, water, air, and people within a major landscape—no longer just a concentration of trees.

Introduction

Forest owners as well as the general public are increasingly aware of promoting and working towards sustainability for the nation's forests. Interest in understanding how to pursue well-managed forests can, at times, be confusing due to the wide range of definitions, goals, and perspectives being promoted by stakeholders with different interests. The National Association of State Foresters developed these Principles and Guides as a means to assist in assessing the potential effectiveness of any system or program's capacity to guide a forest owner or manager in efforts to achieve a well-managed forest while attaining his/her objectives.

The Principles and Guides should *not* be used as a directive *nor* are they an appropriate basis for determining eligibility for incentives related to federal cost share programs. They are designed to help state forestry agencies, forest landowners, and other interested members of the public sort through the options available to determine which systems and programs meet widely accepted tests of appropriate content and outcomes. Size or scale of the management unit or ownership is an essential consideration in their use.

I. Principles of a Well-Managed Forest

Any system or program professing to result in a well-managed forest when implemented, should address the premise of the following principles in its requirements for planning, implementation and [assessment](#):

1. Contribute to the Conservation of Biological Diversity of the Forest and the Landscape in Which it Resides
2. Maintain or Improve Productive Capacity
3. Maintain the Health and Vigor of the Forest and its Landscape/Watershed
4. Protect Soil and Water Resources
5. Consider Carbon Cycles
6. Consider Socio-Economic Benefits and Impacts
7. Comply with Laws and Legally Adopted Rules and Implement Applicable Guidelines in States Not Using the Regulatory Approach

II. Performance Guides to Address the Core Principles in Evaluating Program/System Implementation

An evaluation of the systems and plans/practices to determine whether the Core Principles have been addressed can be done using the following Performance Guides:

1. Contribute to the Conservation of Biological Diversity of the Forest and Landscape in Which it Resides

Systems

- A. Available expertise is sought for assessing biodiversity considerations at the site and landscape levels.
- B. Rare and endangered species and plant communities are identified and their protection or enhancement is addressed.
- C. Forest dynamics, major disturbances and catastrophic events are factored into decision making.

Plans and Practices

- A. Necessary expertise (consultants, State Forestry, Natural Heritage Program staff, etc.) has been utilized to assess the biodiversity contribution of the property.
- B. The forest's diversity, uniqueness and risks (pests, fire, weather, etc.) have been identified and are a consideration in management.



- C. Forest dynamics, major disturbances and catastrophic events are factored into biodiversity decision making.

2. Maintain or Improve Productive Capacity

Systems

- A. Timber and non-timber products and habitats are identified for the forest.
- B. Long-term and short-term productive capacities and targets are established.
- C. Targets are sustainable.
- D. Appropriate science and technology is used.

Plans and Practices

- A. The productive capacity of the forest has been mapped for timber and significant non-timber products have been identified.
- B. Growth, mortality and harvest rates of the forest types have been determined.
- C. Regeneration after harvest is planned and successfully implemented.
- D. Long-term site capacity is maintained.
- E. Harvest, utilization, and marketing are efficient.
- F. Loggers and other contractors that have been trained are used.
- G. Appropriate expertise is used regarding wildlife management.
- H. Habitats, including sites at environmental risk and with ecological/cultural uniqueness, are identified and a consideration of management.

3. Maintain the Health and Vigor of the Forest and its Landscape/Watershed

Systems

- A. Tree species selection, stocking levels, age class distribution, integrated pest management and fuel loadings are addressed with the objective of reducing the risk of insect and disease outbreaks and unwanted wildfire and promoting long-term forest vigor.
- B. Cooperation regarding forest risk assessments, monitoring, prevention and incident response is encouraged.

- C. Chemicals are used appropriately and safely within the manufacturer's recommendations.
- D. Grazing is managed to prevent negative impacts.

Plans and Practices

- A. Tree species selection, stocking levels, spacing, age-class distribution, regeneration methods, insect and disease outbreaks, fuel loads, and wildfires are managed to reduce risk and ensure long-term forest vigor.
- B. Fuel loads, insect and disease populations and overall forest vigor are addressed.
- C. Approaches to monitoring, prevention, and incident response are in place and include cooperation with local, state and federal agencies and neighboring landowners as appropriate.
- D. Grazing is managed to prevent negative impacts.
- E. Introduction and spread of invasive non-native flora and fauna is addressed.

4. Protect Soil and Water Resources

Systems

- A. Relevant mapped, soils, terrain and water resources (streams, ponds, wetlands) data are used.
- B. Management practices to ensure soil stability, protect and enhance soil productivity and water quality are used.
- C. Best management practices to protect soil and water during all management activities are used.

Plans and Practices

- A. Current mapped data on soils and terrain is included in the plan and used in management.
- B. Storm dynamics are recognized and planned for.
- C. Soil stability, water quality and soil productivity are protected.
- D. Appropriate guides and plans are in place and followed in road placement, design, maintenance and retirement, especially at stream crossings.
- E. Fire use, management and response is appropriately planned and conducted.



- F. State Best Management Practices are understood and incorporated in plans and complied with during all phases of management activities.
- G. [Wetland](#) hydrological function and [aquatic](#) habitat are a consideration in management.

5. Consider Carbon Cycles

Systems

- A. Forest biomass considerations by forest types, age classes and successional stages are addressed.
- B. The management of forest ecosystems in a manner that enhances carbon budgets and cycles is promoted.

Plans and Practices

- A. Carbon cycles are considered in the forest management plan.

6. Consider Socio-Economic Benefits and Impacts

Systems

- A. The system recognizes that production and consumption of wood and non-wood products, their volume, value (including value added through downstream processing), their supply and consumption are important.
- B. Recreation and tourism is promoted consistent with the health of the forest and the nature of the ownership and owner objectives.
- C. Appropriate economic and social values of the forest are considered.

Plans and Practices

- A. Sound economic approaches, considering both long-term and short-term goals, are used when harvesting both wood and non-wood products.
- B. Available resources are used to identify, manage and protect unique forest features.
- C. Unique biological, ecological, geological and cultural sites are considered in the forest management plan.

7. Comply with Laws and Rules and Implement Applicable Guidelines in States Not Using the Regulatory Approach

Systems

- A. Conformance to all local, state and federal laws is required.
- B. Appropriate input is expected.
- C. Monitoring of implementation is expected.

Plans and Practices

- A. Local, state and federal laws, regulations and state BMPs are followed.
- B. Operations are planned, conducted and comply with safety rules.
- C. The impacts on neighbors and the community are considered during operations.
- D. Aesthetics are considered in plans and operations.
- E. Conversion to other land uses is only done according to local land use plans and ordinances.

